Serial No.: 09/824,332 Filed: 4/2/2001
Amendment dated: September 20, 2004
Reply to Office Action of: 7/26/2004
Atty. Docket No.:MAC-0113

LISTING OF CLAIMS:

Claims 1-25 (canceled)

Claim 26 (currently amended) A fluidized catalytic cracking unit comprising a reactor comprising at least one feed nozzle, wherein at least one of the feed nozzles comprises:

(i) a central passageway comprising at least one FCC feed inlet;

(ii) an outlet comprising an atomization zone in fluid communication with the reactor;

(iii) at least one atomization fluid passageway fluidly communicating with the central passageway via an atomization fluid passageway outlet; ~~and,~~

(iv) a heating zone comprising a plurality of fluid passage means therein, each fluid passage means having at least one fluid entrance and exit to permit the atomization fluid and the FCC feed to flow separately into and through, wherein said heating zone is configured to promote heat exchange between the FCC feed and the atomization fluid before the FCC feed and atomization fluid mix; and

(v) a first mixing zone comprising a second inlet for an atomization fluid positioned upstream from the atomization fluid passageway outlet wherein the second inlet comprises a sparger.

Claim 27-28 (canceled).

Claim 29 (original) The fluidized catalytic cracking unit according to claim 26 wherein the central passageway further comprises a stream splitter positioned within the central passageway upstream from the position at which the atomization fluid passageway exits into the central passageway.

Claim 30 (original) The fluidized catalytic cracking unit according to claim 26 wherein the atomization fluid passageway outlets have a forward acute angle greater than 60°.

Claim 31 (original) The fluidized catalytic cracking unit according to claim 26 wherein the central passageway has a circular cross-section and wherein the atomization fluid passageway outlets are positioned concentrically about the central passageway.

Claim 32 (original) The fluidized catalytic cracking unit according to claim 26 wherein the central passageway has a cross-section having two-dimensions, wherein at least one of the two dimensions converges in a downstream direction along at least a portion of the length of the central passageway.

Claim 33 (original) The a fluidized catalytic cracking unit according to claim 26 wherein the atomizing zone further comprises a spray distributor comprising a fluid passageway extending therethrough.

Claim 34 (original) The fluidized catalytic cracking unit according to claim 33 wherein the spray distributor fluid passageway has a cross-section comprising two dimensions and wherein at least one of the dimensions diverges in a downstream direction along at least a portion of the length of the spray distributor fluid passageway.

Claim 35 (original) The fluidized catalytic cracking unit according to claim 32 wherein the atomizing zone further comprises a spray distributor comprising a fluid passageway extending therethrough and wherein the spray distributor fluid passageway has a cross-section comprising two dimensions and wherein at least one of the dimensions diverges in a downstream direction along at least a portion of the length of the spray distributor fluid passageway.

Claim 36 (original) The fluidized catalytic cracking unit according to claim 35 wherein the converging dimension of the central passageway and the diverging dimension of the spray distributor fluid passageway are co-planar.

Claim 37 (previously presented) The apparatus according to claim 25 wherein the central passageway has a cross-section having two-dimensions, wherein both dimensions converge in a downstream direction along at least a portion of the length of the central passageway.

Claim 38 (previously presented) The apparatus according to claim 25 comprising a plurality of the feed nozzles.

Claim 39 - 53 (canceled)

Claim 54 (original) The apparatus according to claim 28 wherein said sparger comprises at least one fluid passageway configured to allow fluid passage into said central passageway, wherein said sparger fluid passageways are configured to promote radial flow, axial flow, or combinations thereof, said flow relative to the overall direction of fluid flow in said central passageway.

Claim 55-57 (canceled)

Claim 58 (new) The at least one feed nozzle of claim 26.